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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/728,626	11/30/2000	Aswartha Narayana	K35A0685	5463

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EXAMINER
OLSON, JASON C

ART UNIT	PAPER NUMBER
2697	

DATE MAILED: 06/09/2003

3

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/728,626	NARAYANA ET AL.	
	Examiner	Art Unit	
	Jason C Olson	2697	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

od for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-9 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-9 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

1. Claim 9 is objected to because of the following informalities: Claim 9 is dependent on claim 1, but recites "the linear vibrations". Claim 1 does not contain the reference of "linear vibrations", therefore claim 9 lacks antecedent bases for this limitation in the claim. However, claim 8, which is depend on claim 1, recites the limitation of "linear vibration". The Examiner has taken the taken the liberty to examine claim 9 as if it depended upon claim 8, in which "the linear vibrations" has antecedent basis. Appropriate correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-9 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. Pat. No. 5,663,847 to Abramovitch.

Regarding claim 1, Abramovitch discloses a magnetic disk drive having a head disk assembly (HDA) including a base (Col. 4, Ln. 1-2), a rotating disk that carries position information in a plurality of servo wedges that are distributed around the disk (Col. 1, Ln. 13-24), a rotary actuator that pivots relative to the base and carries a

transducer that periodically reads the position information from the servo wedges on the rotating disk, (Col. 1, Ln. 13-24) a VCM circuit that includes a voice coil motor (VCM) that responds to a control effort signal, that is periodically adjusted by a servo control system such that the transducer tends to follow a track that is defined by the position information during a track-following operation, (Col. 1, Ln. 13-24) a method of adaptively reducing an effect of vibration during the track following operation comprising the steps of:

mounting a sensor within the magnetic disk drive to produce a sensor signal in response to a vibration that tends to cause the rotary actuator to move off-track (Col. 3. Ln. 67; Col. 4, Ln. 1-8);

reading the position information from a presently active servo wedge (Col. 1, Ln. 13-24);

producing a position error signal based on a difference between an indicated position signal and a target position signal (Col. 1, Ln. 13-24);

calculating a nominal control effort signal based on the position error signal (Col. 1, Ln. 13-24; Col. 4, Ln. 13-16);

reading the sensor signal to produce a sensor value associated with the presently active servo wedge (Col. 5, Ln. 53-55);

modifying the sensor value based on a sensor gain value to produce a control effort adjustment signal (Fig. 3, Items 302, 306, and 308; It can be seen that the signal from the vibration sensor (302) is put through a filter (306)

and a filter gain (308) in order to produce a vibration compensation signal);

adjusting the nominal control effort signal with the control effort adjustment signal to produce an adjusted control effort signal (Fig. 3, Items 314 and 310; It can be seen that the nominal compensation signal is adjusted by the vibration compensation signal to produce an actuator input signal),

outputting the adjusted control effort signal to the VCM circuit (Col. 7, Ln. 25-28; Fig. 3, Item 304; It can be seen that the actuator input circuit is input into the electrical mechanical system (304), which contains the VCM circuit.); and

altering the sensor gain value based on the position error signal and the sensor value associated with the presently active servo wedge for use during a next active servo wedge (Col. 8, Ln. 4-41).

Regarding claim 2, Abramovitch discloses all the limitations of claim 1. Abramovitch further teaches a method of adaptively reducing an effect of vibration during the track following operation, wherein the step of altering the sensor gain value based on the position error signal and the sensor value associated with the presently active servo wedge for use in a next active servo wedge is a accomplished by setting an adaptive gain filter (Col. 8, Ln. 4-41).

Regarding claim 3, Abramovitch discloses all the limitations of claim 2. Abramovitch further teaches a method of adaptively reducing an effect of vibration

during the track following operation wherein the adaptive gain filter has one coefficient (Col. 7, Ln. 40-43; KACC is one coefficient of the adaptive gain filter.).

Regarding claim 4, Abramovitch discloses all the limitations of claim 2. Abramovitch further teaches a method of adaptively reducing an effect of vibration during the track following operation wherein the adaptive gain filter has multiple coefficients (Col. 7, Ln. 40-43; KACC and CACC are coefficient of the adaptive gain filter.).

Regarding claim 5, Abramovitch discloses all the limitations of claim 1. Abramovitch further teaches a method of adaptively reducing an effect of vibration during the track following operation wherein the VCM circuit further includes a DAC and wherein the step of outputting the adjusted control effort signal to the VCM circuit comprises the sub steps of:

providing the adjusted control effort signal to the DAC (Col. 5, Ln. 25-28); and

outputting an analog control effort signal that corresponds to the adjusted control effort signal from the DAC to the VCM (Col. 5, Ln. 25-28).

Regarding claim 6, Abramovitch discloses all the limitations of claim 1. Abramovitch further teaches a method of adaptively reducing an effect of vibration during the track following operation wherein the step of modifying the sensor value based on a sensor gain value to produce a control effort adjustment signal is accomplished by multiplying the sensor value by the gain value (Col. 8, Ln. 4-41).

Regarding claim 7, Abramovitch discloses all the limitations of claim 1. Abramovitch further teaches a method of adaptively reducing an effect of vibration

during the track following operation wherein the step of adjusting the nominal control effort signal with the control effort adjustment signal to produce an adjusted control effort signal is accomplished by adding the control effort adjustment value to the nominal control effort value (Fig. 3, Items 314 and 310; It can be seen that the nominal compensation signal is added to the vibration compensation signal to produce an actuator input signal).

Regarding claim 8, Abramovitch discloses all the limitations of claim 1. Abramovitch further teaches a method of adaptively reducing an effect of vibration during the track following operation wherein the vibration is a linear vibration (Col. 5, Ln. 34-37; Col. 9, Ln. 17-20).

Regarding claim 9, Abramovitch discloses all the limitations of claim 1. Abramovitch further teaches a method of adaptively reducing an effect of vibration during the track following operation wherein the rotary actuator exhibits an effective imbalance that is affected by the linear vibrations (Col. 4, Ln. 12-21; Col. 5, Ln. 34-37; Col. 9, Ln. 17-20; It in inherent that a completely balanced actuator is an ideal concept, because nothing can be perfectly balanced.).

Conclusion

3. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patents are cited to further show the state of the art with respect to disk storage devices.

(a) U.S. Pat. No. 5,299,075 to Hank, which discloses a shock attenuation in a disk storage device using a variable gain acceleration sensor.

(b) U.S. Pat. No. 5,521,772 to Lee et al., which discloses a disk stroage device with an acceleration rate sensor.

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jason C Olson whose telephone number is 703.305.8325. The examiner can normally be reached on Monday thru Thursday 7:30-5:30; alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, JEFFERY A Hofsass can be reached on 703.305.4717. The fax phone numbers for the organization where this application or proceeding is assigned are 703.308.6743 for regular communications and 703.308.6743 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703.305.3900.

jco
May 30, 2003

Richemond Dorvil
Primary Examiner